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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK

ATTORNEY'S DOCKET NUMBER

(2000)

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. § 371**

449122010600

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/936931
Not yet assigned

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/DE00/00853

March 17, 2000

March 19, 1999

TITLE OF INVENTION

**MULTIPOLE, PERMANENT-MAGNET ROTOR FOR A ROTATING ELECTRICAL MACHINE, AND A
METHOD FOR PRODUCING SUCH A ROTOR**

APPLICANT(S) FOR DO/EO/US

Ingo SCHUERING

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application under PCT Article 19 (35 U.S.C. 371(c)(2)).
 - a. ☒ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information: 1. International Search Report 2. IPER 3. Application Data Sheet 4. Return receipt postcard.

CERTIFICATE OF HAND DELIVERY

I hereby certify that this correspondence is being hand filed with the United States Patent and Trademark Office in Washington, D.C. on September 19, 2001.

Melissa Garton
Melissa Garton

U.S. APPLICATION NO. (if known, see 37 CFR 1.5) Not yet assigned 09/936931		INTERNATIONAL APPLICATION NO. PCT/DE00/00853		ATTORNEY'S DOCKET NUMBER: 449122010600	
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21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO.....\$1,000.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO.....\$860.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....\$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provision of PCT Article 33(1)-(4)\$690.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4)\$100.00				CALCULATIONS PTO USE ONLY	
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$860.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$0	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	6 - 20 =	0	x \$18.00	\$0	
Independent claims	1 - 3 =	0	x \$80.00	\$0	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00	\$270.00	
TOTAL OF ABOVE CALCULATIONS =				\$860.00	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$0	
SUBTOTAL =				\$1130.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				+	\$0
TOTAL NATIONAL FEE =				\$1130.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				+	\$0
TOTAL FEES ENCLOSED =				\$1130.00	
				Amount to be refunded:	\$
				charged:	\$

a. ☒ Please charge my **Deposit Account No. 03-1952** in the amount of \$1130.00 to cover the above fees. Please reference 449122010600. A duplicate copy of this sheet is enclosed.

b. ☒ The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment to **Deposit Account No. 03-1952**. Please reference 449122010600. A duplicate copy of this sheet is enclosed.

c. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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Kevin R. Spivak
Registration No. 43,148

PCT
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 INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE
 INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)



<p>(51) Internationale Patentklassifikation ⁷ : H02K 1/27</p>	A1	<p>(11) Internationale Veröffentlichungsnummer: WO 00/57537</p> <p>(43) Internationales Veröffentlichungsdatum: 28. September 2000 (28.09.00)</p>		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>(21) Internationales Aktenzeichen: PCT/DE00/00853</p> <p>(22) Internationales Anmeldedatum: 17. März 2000 (17.03.00)</p> <p>(30) Prioritätsdaten: 199 14 021.9 19. März 1999 (19.03.99) DE</p> <p>(71) Anmelder (für alle Bestimmungsstaaten ausser US): SIEMENS AKTIENGESELLSCHAFT [DE/DE]; Wittelsbacherplatz 2, D-80333 München (DE).</p> <p>(72) Erfinder; und (75) Erfinder/Anmelder (nur für US): SCHÜRING, Ingo [DE/DE]; Bruchsaler Str. 14, D-10715 Berlin (DE).</p> <p>(74) Gemeinsamer Vertreter: SIEMENS AKTIENGESELLSCHAFT; Postfach 22 16 34, D-80506 München (DE).</p> </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>(81) Bestimmungsstaaten: CA, CN, IN, JP, KR, PL, US, europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p>Veröffentlicht <i>Mit internationalem Recherchenbericht.</i></p> </td> </tr> </table>			<p>(21) Internationales Aktenzeichen: PCT/DE00/00853</p> <p>(22) Internationales Anmeldedatum: 17. März 2000 (17.03.00)</p> <p>(30) Prioritätsdaten: 199 14 021.9 19. März 1999 (19.03.99) DE</p> <p>(71) Anmelder (für alle Bestimmungsstaaten ausser US): SIEMENS AKTIENGESELLSCHAFT [DE/DE]; Wittelsbacherplatz 2, D-80333 München (DE).</p> <p>(72) Erfinder; und (75) Erfinder/Anmelder (nur für US): SCHÜRING, Ingo [DE/DE]; Bruchsaler Str. 14, D-10715 Berlin (DE).</p> <p>(74) Gemeinsamer Vertreter: SIEMENS AKTIENGESELLSCHAFT; Postfach 22 16 34, D-80506 München (DE).</p>	<p>(81) Bestimmungsstaaten: CA, CN, IN, JP, KR, PL, US, europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p>Veröffentlicht <i>Mit internationalem Recherchenbericht.</i></p>
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<p>(54) Title: MULTIPOLE, PERMANENT-MAGNET ROTOR FOR A ROTATING ELECTRICAL MACHINE AND METHOD FOR PRODUCING SUCH A ROTOR</p> <p>(54) Bezeichnung: MEHRPOLIGER, PERMANENTERREGTER ROTOR FÜR EINE ROTIERENDE ELEKTRISCHE MASCHINE UND VERFAHREN ZUR HERSTELLUNG EINES SOLCHEN ROTORS</p>				
<p>(57) Abstract</p> <p>The invention relates to a rotating electrical machine. A permanent-magnet rotor produced in flux-concentrating style is used when the nominal power is greater than 100 kW. The aim of the invention is to enable an assembly that is as simple as possible. To this end, two adjacent half-yokes (3, 2) of two poles as well as magnets (5) that are arranged therebetween form a pole element (7) which can be independently fixed on the rotor body (1).</p>				

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Description

Multipole, permanent-magnet rotor for a rotating
electrical machine, and a method for producing such a
5 rotor

The invention relates to the field of rotating
electrical machines, and is applicable to the design
configuration of rotor cores which are fitted with
10 permanent magnets using what is referred to as flux
concentration construction.

Now that special permanent magnets, referred to as hard
ferrite, have been successfully developed, which are
15 matched to the stringent requirements of electrical
machines, such magnets have now been used to an ever
greater extent to produce the rotating magnetic field
in the rotating electrical machines. Various options
for the arrangement of the permanent magnets in the
20 rotor or in the stator have been developed for motors
and generators with rated powers up to 30 kW at
3000 rpm. In this case, what is referred to as the
"flux concentration construction" has been found to be
the technically better solution above a rated power of
25 several hundred watts. One embodiment of this
construction is to arrange the permanent magnets in the
pole gaps in the rotor (Siemens Journal 49, 1975, Issue
6, page 368 et seq./369, Figure 3). One known design
solution for this purpose is to arrange the permanent
30 magnets, which have a flat rectangular cross section
and are designed to be flat in the magnetization
direction, radially with respect to the rotor axis in
slot-like spaces in each case between two yokes that
are fixed on the rotor body (EP 0 582 721 B1).

35

In another known rotor, fitted with permanent magnets,
for an electrical machine, poles which are welded to a
hollow

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rotor shaft are shaped in such a manner that there is an accommodation area with a trapezoidal cross section between two poles, for permanent magnets which likewise have a trapezoidal cross section. The outer surface of the rotor is in this case formed by shrunk-on reinforcements composed of a copper-beryllium alloy (US 4,242,610).

With regard to the handling of permanent magnets when constructing rotors of electrical machines, it is furthermore known for the magnet bodies to be installed in the unmagnetized state and to be magnetized once they have been arranged on the rotor, for example using the stator winding of the electrical machine (EP 0 195 741 B1).

Such magnets which store a large amount of energy, for example based on neodymium-iron-boron (NeFeB), have been developed recently, the use of permanent-magnet rotors is now feasible even for electrical machines with a rated power of more than 100 kW, for example in ship propulsion systems with a rated power of 5 to 30 W. Machines such as these have a rotor diameter of more than 25 cm up to about 300 cm. If the rotors of machines such as these are constructed using flux concentration, this involves difficulties in the installation and securing of the magnets.

Against the background of a permanent-magnet rotor having the features in the precharacterized clause of patent claim 1, the invention is based on the object of designing the rotor construction such that the permanent magnets can be stored without exerting large amounts of force.

35

In order to achieve this object, the invention provides for each yoke to be subdivided in the circumferential

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direction into two half yokes, which each extend over half of one pole pitch, and that the two mutually adjacent half-yokes of two yokes arranged alongside one another are in each case connected by means of end points to form a pole element, and each pole element is fixed on its own on the rotor body. In this case, the pole elements can be designed such that either each of the two half-yokes is fitted with permanent magnets on its surface facing a slot-like intermediate space, or such that only one of the two half-yokes is fitted with permanent magnets on the surface facing the other half-yoke. If the permanent magnets are arranged on the corresponding surfaces of the half-yokes and of the pole elements on the rotor body, it is expedient for the magnets to be fitted to the half-yokes in the unmagnetized state, and for the magnets to be magnetized once the two half-yokes have been joined together to form a pole element, but before the pole elements are fitted onto the rotor body.

Such a configuration of the poles and association between the magnets and the poles of the rotor allows both the pole elements, which comprise the half-yokes and magnets, and the individual magnets to be handled without exerting any excessive force while being arranged - generally by bonding - on the corresponding surfaces of the half-yokes. In the case of relatively long rotors, it is also recommended that the individual pole elements be subdivided into a number of partial pole elements in the axial direction of the rotor, in order to produce convenient units which are easy to magnetize.

When the individual parts of a pole element are being joined together, it may be expedient to fill the spaces which remain between the two half-yokes with a material which expands under the influence of impregnation resins. Furthermore,

the permanent magnets which are arranged between the half-yokes can also be secured in the radial direction by double wedges, which are supported on corresponding projections on the half-yokes.

5

The two half-yokes which form a pole element are in each case expediently connected by means of two preferably amagnetic end plates, which are screwed and pinned to the two half-yokes and permanently fix the two half-yokes with respect to one another. Once the pole elements have been assembled, they can be provided with surface protection by subsequent impregnation with a resin which, in particular, protects the corrosion-sensitive permanent magnets permanently against damaging influences.

15

Once the pole has been magnetized, they are placed on the tubular rotor body, and are screwed to it from the inside or outside. The rotor body is in this case preferably amagnetic.

20

The configuration of permanent-magnet rotors provided according to the invention can be applied both to machines with an internal rotor and to machines with an external rotor. External rotor machines may be, in particular, generators in wind power systems, or drive motors for hoist systems.

25

Three exemplary embodiments of rotors designed and produced according to the invention are illustrated, in detail form, in Figures 1 to 5, in which:

30

Figure 1 shows a first exemplary embodiment of the configuration of the poles and yokes,

35

Figure 2 shows a front view of a pole element designed according to the invention,

Figure 3 shows the subdivision of a pole element into a number of partial pole elements,

Figure 4 shows a second exemplary embodiment of the configuration of poles and yokes, and

Figure 5 shows the configuration of poles and yokes arranged on an external rotor.

Figure 1 shows, in the form of a detail, a cross-sectional region of a rotor of an electrical machine, which comprises a rotor body 1, rotor yokes 2/3 mounted on the rotor body 1, and permanent magnets 5 mounted on the rotor yokes. Each rotor yoke is in this case subdivided into two half-yokes 2, 3, with a slot-like intermediate space 4 being provided between each two yokes. The permanent magnets 5 are magnetized in the circumferential direction and are arranged in the slot-like intermediate spaces 4, with one permanent magnet 5, or one magnet layer comprising a large number of relatively small permanent magnets, in each case being arranged on that surface of the respective half-yoke which faces the slot-like intermediate space 4. The permanent magnets 5 are in this case normally bonded to the half-yoke 2 or 3. Alternatively, the two magnet layers can also be associated with only one of the two half-yokes.

The space which remains between two half-yokes 3 and 2 and between the mutually adjacent permanent magnets 5 may be filled, if required, with a material 9 which can expand under the influence of impregnation resin. Furthermore, to provide radial fixing for the permanent magnets 5, double wedges 8 can be arranged both between the rotor body 1 and the permanent magnets, and between the permanent magnets and the periphery of the rotor.

According to Figure 2, two half-yokes 3, 2 are associated with different yokes are in each case joined to the permanent magnets 5 arranged on the corresponding side surfaces, by means of end plates 6, to form a pole element 7. A number of such pole elements are arranged independently of one another on the circumference of the rotor body 1, and are connected to the rotor body, for example by means of a screw joint.

10

During the production of the pole elements 7, it is expedient firstly to arrange, for example to bond, the permanent magnet (which has not yet been magnetized) on the corresponding side surface of the half-yoke 2 or 3. Two half-yokes 2, 3 are then associated with one another, and are fixed with respect to one another by means of two end plates 6. After this, the pole element 7 that has been produced in this way is inserted into a magnetization apparatus, and the permanent magnets 5 are magnetized. The magnetized pole element 7 can then be arranged on the rotor body 1.

20

In electrical machines having a relatively long rotor, it is recommended that the respective pole element 7 be subdivided into partial pole elements 73 in the axial direction of the rotor, as is illustrated in Figure 3. In this case, a number of partial pole elements as illustrated in Figure 2 are then arranged axially one behind the other on the rotor body.

30

Figure 4 shows a variant of Figure 1. In this case, the half-yokes 2', 3' are assigned such that there is a cavity 71, which acts as a flux barrier, between them. The proportion of the magnetic flux produced in the individual half-yokes by the stator winding can then be influenced via this cavity.

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The rotor illustrated in Figure 5 is an external rotor with an externally arranged supporting body 11. The arrangement of half-yokes 2'' and 3'' and the configuration of the permanent magnets 5 corresponds in principle to the exemplary embodiments shown in Figures 1 and 4. In this case, in contrast to Figure 4, a V-shaped, flux-free area 72 is provided between each two half-yokes.

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Patent Claims

1. A multipole, permanent-magnet rotor for a rotating electrical machine, in which permanent magnets which are cuboid in order to produce salient magnet poles and are designed to be flat in the magnetization direction are arranged radially with respect to the rotor axis in slot-like spaces between each two yokes that are fixed on the rotor body,
- characterized
- in that each yoke is subdivided in the circumferential direction into two half-yokes (2, 3) which each extend over half of one pole pitch, and
- in that the two mutually adjacent half-yokes (3, 2) of two yokes arranged alongside one another are in each case connected by means of end points (6) to form a pole element (7), and each pole element (7) is fixed on its own on the rotor body (1).
2. The permanent-magnet rotor as claimed in patent claim 1,
- characterized in that
- each of the two half-yokes is fitted with permanent magnets (5) on its surface facing a slot-like intermediate space (4).
3. The permanent-magnet rotor as claimed in patent claim 2,
- characterized
- in that the intermediate spaces (4) which remain between the two half-yokes (2, 3) of a pole element (7) are filled with material (9) which can expand under the influence of impregnation resin.
4. The permanent-magnet rotor as claimed in one of claims 1 to 3,
- characterized
- in that the permanent magnets (5) are secured radially by means of double wedges (8).

in that the individual pole elements (7) are subdivided into a number of partial pole elements (73) in the axial direction of the rotor.

6. A method for producing a permanent-magnet rotor as claimed in patent claim 1, in which non-magnetized magnets are magnetized before being arranged on the rotor body,
characterized
in that the magnets (5) are magnetized once the two half-yokes have been joined together to form a pole element (7).

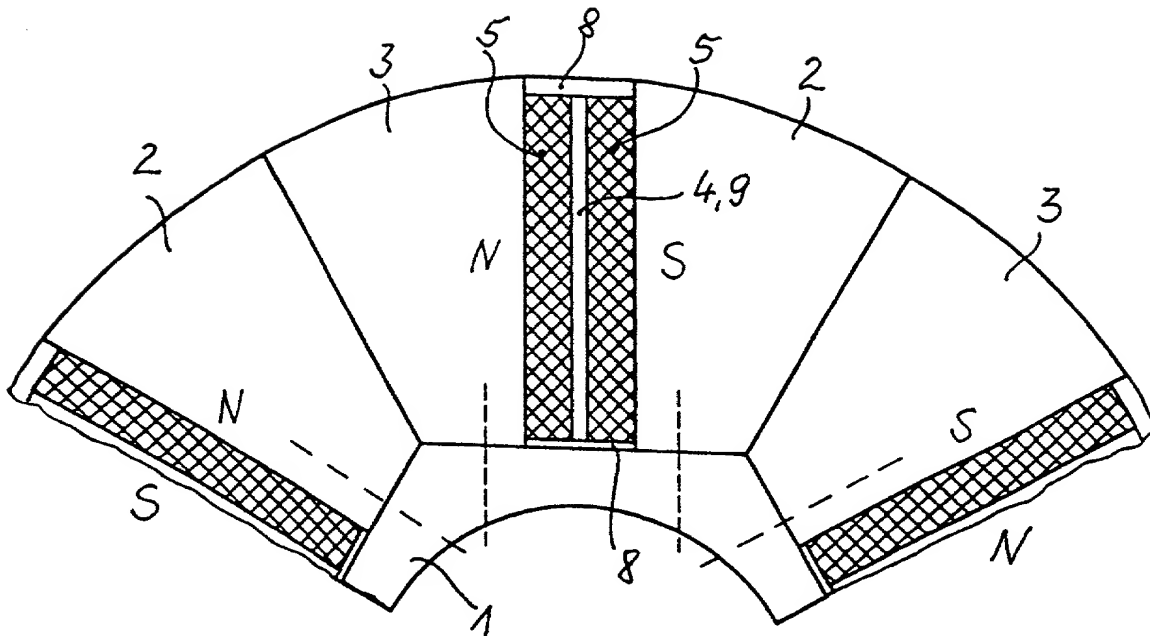


FIG 1

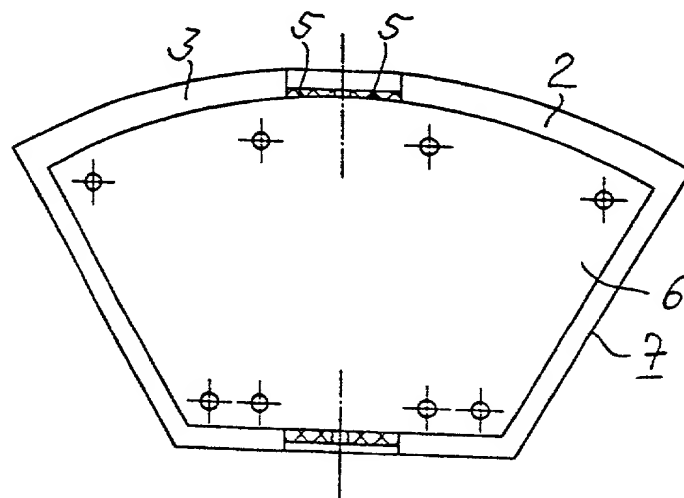


FIG. 2

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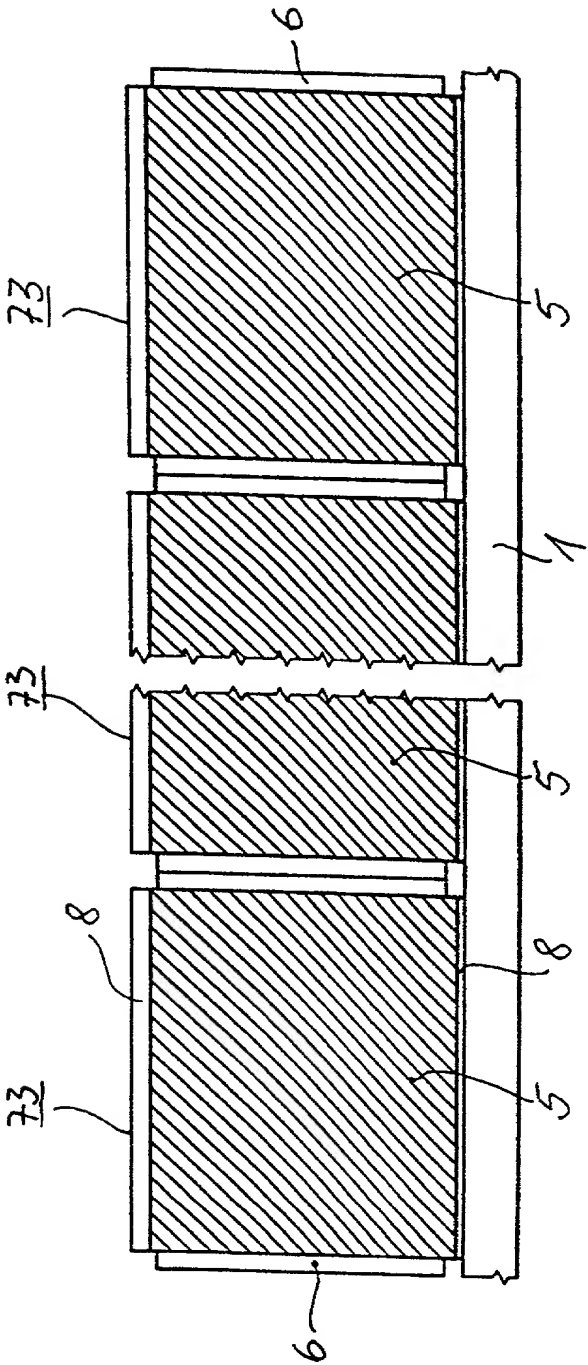


FIG. 3

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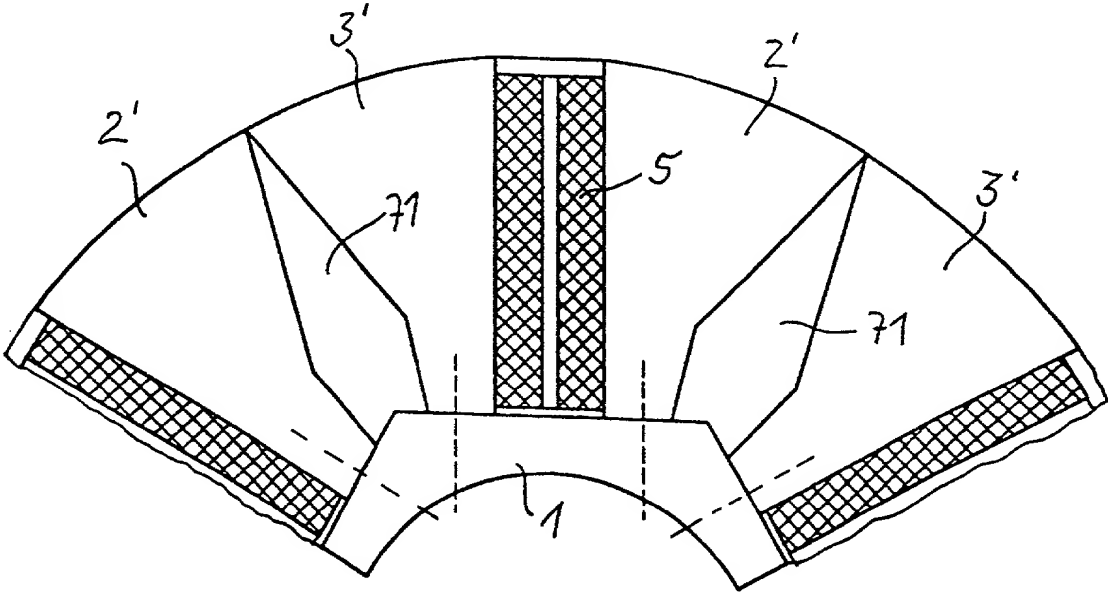


FIG. 4

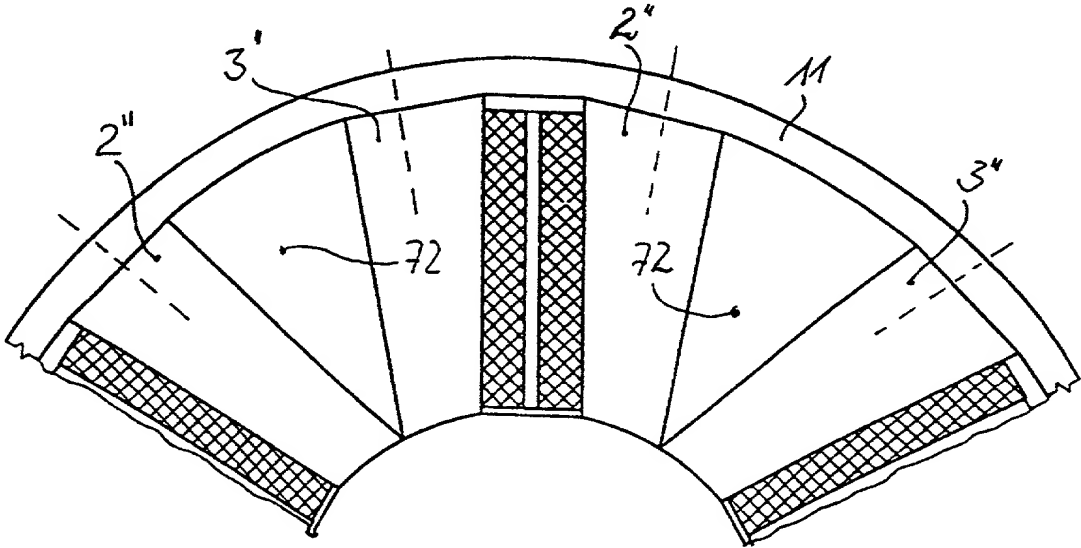


FIG. 5

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German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den nachstehend benannten Patentanwalt (oder die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent- und Warenzeichenamt: (Name und Registrationsnummer anführen)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

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2000 Pennsylvania Ave., NW 20006-1888 Washington, DC
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Voller Name des einzigen oder ursprünglichen Erfinders:		Full name of sole or first inventor:	
INGO SCHUERING		INGO SCHUERING	
Unterschrift des Erfinders	Datum	Inventor's signature	Date
X Ingo Schuering	23.01.2002	X Ingo Schuering	23.01.2002
Wohnsitz		Residence	
SCHOENWALDE, GERMANY		SCHOENWALDE, GERMANY DEX	
Staatsangehörigkeit		Citizenship	
DEUTSCH		GERMAN	
Postanschrift		Post Office Address	
AKAZIENALLEE 15		AKAZIENALLEE 15	
14621 SCHOENWALDE		14621 SCHOENWALDE	
DEUTSCHLAND		GERMANY	
Voller Name des zweiten Miterfinders (falls zutreffend):		Full name of second joint inventor, if any:	
Unterschrift des Erfinders		Second Inventor's signature	
Datum		Date	
Wohnsitz		Residence	
Staatsangehörigkeit		Citizenship	
Postanschrift		Post Office Address	

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors).

Declaration and Power of Attorney For Patent Application**Erklärung Für Patentanmeldungen Mit Vollmacht****German Language Declaration**

#3

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

As a below named inventor, I hereby declare that:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

My residence, post office address and citizenship are as stated below next to my name,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Mehrpoliger, permanenterregter Läufer
für eine rotierende elektrische
Maschine und Verfahren zur Herstellung
eines solchen Läufers

MULTIPOLE PERMANENT-MAGNET
ROTOR FOR A ROTATING
ELECTRICAL MACHINE AND METHOD
FOR PRODUCING SUCH A ROTOR

deren Beschreibung

the specification of which

(zutreffendes ankreuzen)

☐ hier beigefügt ist.

☒ am 17.03.2000 als

PCT internationale Anmeldung

PCT Anwendungsnummer PCT/DE00/00853

eingereicht wurde und am

abgeändert wurde (falls tatsächlich abgeändert).

(check one)

☐ is attached hereto.

☒ was filed on 17.03.2000 as

PCT international application

PCT Application No. PCT/DE00/00853

and was amended on _____
(if applicable)

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

004210 FEB 06 2000

IDNR: 2590 / V: 99-1.00 / B: Val

German Language Declaration

Prior foreign applications

Priorität beansprucht

Priority Claimed

19914021.9

(Number)
(Number)

DE

(Country)
(Land)

19.03.1999

(Day Month Year Filed) .
(Tag Monat Jahr eingereicht)

☒

Yes
Ja

☐

No
Nel

(Number)
(Nummer)

(Country)
(Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

☐

Yes
Ja

No
Neir

(Number)
(Nummer)

(Country)
(Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

☐

Yes
Ja

☐ No
☐ Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE00/00853

(Application Serial No.)
(Anmeldebeurteilnummer)

17.03.2000

(Filing Date D, M, Y)
(Anmeldedatum T, M, J)

anhängig

(Status)
(patent, anhängig,
aufgegeben)

(Status)
(patented, pending,
abandoned)

(Application Serial No.)
(Anmeldeseriennummer)

(Filing Date D,M,Y)
(Anmeldedatum T. M: J)

(Status)
(patentiert, anhängig,
aufgeben)

(Status)
(patented, pending,
abandoned)

Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden können, und dass derartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährden können.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.